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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,402	10/17/2001	Yoshihiro Satoh	N32040200W	6789

7590 10/26/2004

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EXAMINER

RICHARDS, N DREW

ART UNIT PAPER NUMBER

2815

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/981,402

Applicant(s)

SATO, YOSHIHIRO

Examiner

N. Drew Richards

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,7-20 and 25 is/are pending in the application.
- 4a) Of the above claim(s) 7-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Upon updating the examiner's search, new references have been found such that claims 1, 2 and 25 are no longer allowable. Therefore, the finality of the rejection of the last Office Action is withdrawn and prosecution is reopened. Applicant's most recently filed amendment has been entered since prosecution is reopened. On 10/14/04 the examiner received authorization from Darryl Walker to cancel non-elected claims 7-20. Since this application is no longer considered in condition for allowance the previously authorized examiner's amendment is not being made at this time and claims 7-20 are still withdrawn from consideration.

Allowable Subject Matter

2. The indicated allowability of claims 1, 2 and 25 is withdrawn in view of the newly discovered reference(s) to Yoshihara et al. (US Pub. 2003/0132525 A1). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

Art Unit: 2815

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshihara et al. (US Pub. 2003/0132525 A1).

Yoshihara et al. disclose a semiconductor device comprising:

a contact 131 which penetrates an interlayer insulating film 103 and is electrically connected with a diffusion layer 113 in the silicon substrate 101 (figure 4);

a gate electrode 111 which is formed on the silicon substrate and contains a nitride film at upper and side portions (figures 12-14 show the formation of the gate electrode including nitride 8 at an upper portion and nitride 10 at a sidewall portion, see paragraphs 100-103);

an insulating film formed from a gas containing carbon (the capacitor dielectric is disclosed in paragraph 120 as being tantalum oxide; the film being formed from a gas containing carbon is a product-by-process limitation that does not structurally distinguish over the prior art); and

a silicon nitride film 121 for preventing carbon diffusion (the silicon nitride film will inherently prevent carbon diffusion to some degree), having a portion sandwiched between the interlayer insulator 103 and the silicon substrate 101 and adjacent to the gate electrode 111 in a direction essentially parallel to a substrate surface, such a sandwiched portion having a thickness in a direction perpendicular to the substrate surface that is less than a thickness of the gate electrode in the perpendicular direction, the silicon nitride film traversing a region except a portion for providing the electrical

Art Unit: 2815

connection between the contact and the diffusion layer, and is formed on the nitride film at the upper and side portions of the gate electrode (figure 4).

With regard to claim 2, the insulating film is disclosed as tantalum oxide. This broad disclosure of the genus of tantalum oxide anticipates the specific species of Ta_2O_5 . Further, the claim reads "tantalum oxide (Ta_2O_5)" so that one would reasonably conclude that tantalum oxide is the same as Ta_2O_5 . The device is also disclosed as being a dynamic random access memory having a memory cell capacitor including the tantalum oxide.

With regard to claim 25, the silicon nitride film for preventing carbon diffusion includes a portion having a bottom surface in contact with and extending parallel to the diffusion layer away from the gate electrode and a top surface in contact with the interlayer insulating film (see figure 4).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Liaw (U.S. Patent No. 5,807,779), Ohuchi et al. (U.S. Patent No. 6,642,585 B2).

6. Applicant's amendment submitted 3/9/04 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set



Art Unit: 2815

to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (571) 272-1736. The examiner can normally be reached on Monday-Friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


NDR
GEORGE ECKERT
PRIMARY EXAMINER